CHAPTER 1 Introduction

1.1 History
1.2 Substructure
   12.1 The pier
   12.2 The foundations
1.3 Open Foundations
1.4 Pile Foundations
   14.1 Different types of pile foundations
   14.2 Benoto piles
   14.3 Housner-waise piles
   14.4 Under-reamed piles
1.5 Well Foundations
1.6 Advantages of Well Foundations
   16.1 Well foundations vs piles foundations
   16.2 Well foundations vs open foundations

CHAPTER 2 Types of Well Foundation

2.1 Introduction
   2.1.1 Circular well
   2.1.2 Double D well
   2.1.3 Double octagonal well
   2.1.4 Rectangular well
   2.1.5 Twin circular well
   2.1.6 Wells with multiple dredge holes
2.2 Ordinary Wells and Caissons

CHAPTER 3 Depth of Well Foundations

3.1 Introduction
   3.1.1 Normal scour in the river
   3.1.2 Local scour around the piers
   3.1.3 Grip below the maximum scour
3.2 Depth of Wells in Rivers Having Non-Scourable Material

CHAPTER 4 The Bearing Capacity

4.1 Introduction
4.2 Bearing Capacity of Rocks
4.3 Bearing Capacity of Soils
4.4 The Standard Penetration Test
4.5 Determination of Safe Bearing Capacity
   4.5.1 Sampling
   4.5.2 Shear failure consideration
   4.5.3 Allowable bearing pressure under well foundations
   4.5.4 Plate load consideration
4.6 Lateral Load Resistance of Well Foundations
   4.6.1 Check for soil pressures by elastic theory
   4.6.2 Derivation of equation used in elastic theory
   4.6.3 Check for ultimate soil resistance
4.6.4 Derivation of equations used in plastic theory
4.7 Special Points Regarding Bearing Capacity
  4.7.1 Wells resting on sand
  4.7.2 Wells resting on clay

CHAPTER 5 Design of Wells

5.1 Introduction
5.2 Collection of Data
5.3 Preliminary Design of Well
5.4 Forces Acting on Wells
5.5 Combination of Loads and Permissible Increase in Working Stresses
  5.5.1 Working stresses
  5.5.2 Foundation pressures
5.6 Design of the Cutting Edge and the Well Curb
  5.6.1 Cutting edges and curbs for well on rock
5.7 Design of Steining
  5.7.1 Forces during open sinking
  5.7.2 Forces during pneumatic sinking
5.8 The Corbel Course
5.9 The Bottom Plug
5.10 The Sand Filling
5.11 The Top Plug
5.12 The Well Cap
5.13 Design Examples

CHAPTER 6 Construction of Well Foundations

6.1 Introduction
6.2 Pitching the Well Curb
6.3 Masonry in Steining
  6.3.1 Concrete mix
6.4 Treatment of the Steining to Reduce Leakage
6.5 Wells in Water
6.6 Making the Island
6.7 Assembly and Launching of Caissons
6.8 Grounding of the Caissons

CHAPTER 7 Open Sinking of Wells

7.1 Introduction
7.2 Equipments for Open Sinking
  7.2.1 Grabs or dredgers
  7.2.2 Hoists
  7.2.3 Straight chisels
  7.2.4 Undercutting chisels
  7.2.5 Pumps
  7.2.6 Air and Water jets
  7.2.7 Equipments for the electric detonation of explosives
7.3 Open Deredging
7.4 Precautions During Well Sinking
7.5 Removal of Snags
7.6 Open Sinking of Wells Through Clay
7.7 Open Sinking of Wells Through Rock
7.8 Special Problems of Open Sinking
  7.8.1 Quick sand conditions
  7.8.2 Removal of obstructions with the help of divers
  7.8.3 Diving dress and the helmet
7.9 Tilts and Shifts
  7.9.1 Precautions to avoid tilts and shifts
  7.9.2 Record of tilts and shifts
  7.9.3 Corrections of tilts and shifts

CHAPTER 8 Pneumatic Sinking of Wells

8.1 Introduction
8.2 Need of pneumatic Sinking
  8.2.1 Limitations
8.3 Plant Required for Pneumatic Sinking
  8.3.1 The air locks
  8.3.2 Accessories and fittings
8.4 Physiological Effects of Compressed Air
8.5 Caisson Sickness-Causes, Prevention and Cure
  8.5.1 Compression
  8.5.2 Hours of working and decompression
  8.5.3 Other precautions at the time of decompression
  8.5.4 Ventilation inside the well
  8.5.5 Temperature and humidity
  8.5.6 Treatment of Caisson sickness
8.6 Excavating and Sinking
  8.6.1 The sinking effort-example
  8.6.2 Blowing of the sand
8.7 Correction of Tilt
8.8 Removal of Excavated Material

CHAPTER 9 Pugging, Sand Filling and Casting

9.1 The Bottom Plug
9.2 Concreting
9.3 Sand Filling
9.4 The Top Plug
9.5 The Well Cap